

REMARKS

Amendments to the Claims

Upon entry of the present amendments, claims 1-11, 13-23 and 25 are pending. Claims 12 and 24 are cancelled without any intention to abandon any subject matter of these claims, but with the intention that claims of the same, lesser, or greater scope may be pursued in a later application.

Claim 1 is amended to specify, in step (b), that the covered conductive-foil layer is sandwiched between the dielectric layer and the layer of protective-carrier sheeting. Support for this amendment is found in the first sentence of the paragraph bridging pages 8 and 9 of the application.

Claim 10 is amended, in part (a), to specify that “a layer of” the conductive foil and the protective carrier sheeting are unwound from a common roll. As in claim 1, part (c) of claim 10 is amended to specify that the covered conductive-foil layer is sandwiched between the dielectric layer and the layer of protective-carrier sheeting. Support for these amendments is found in the last sentence of the last paragraph on page 6, in the first sentence of the paragraph bridging pages 8 and 9, and in the second paragraph on page 10.

Claim 13 is amended to add the term, “and,” after part (b). This amended is non-substantive and support therefor is self-evident.

Claim 22 is amended to specify that the conductive foil is extended from conductive-foil “sources,” wherein at least one of the conductive-foil layers is covered by a layer of protective-carrier sheeting, and wherein those layers of conductive foil and protective-carrier sheeting are extended from a common roll. Previous part (b) is removed as being redundant in view of the amendments to part (a). Support for this amendment is found in the first paragraph on page 10 and in the first full paragraph on page 11 of the application.

Accordingly, the present amendments do not introduce new matter.

Each of the grounds for rejection cited in the Office Action is addressed below, under an appropriate sub-heading.

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35 U.S.C. §112, Second Paragraph

Claims 10, 12, 22 and 24 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

Specifically, the Patent Office indicated that “the conductive foil” in line 4 of claim 10 lacked antecedent basis. Claim 10 has accordingly been amended to refer to “a layer of” the conductive foil. Antecedent basis for the conductive foil is provided by the preceding reference to the “two layers of conductive foil” in lines 3 and 4.

Additionally, the Patent Office cited claims 12 and 24 for conflicting with claims 1 and 13 in view of the amendments previously made to claims 1 and 13. Per the Patent Office’s suggestion, claims 12 and 24 are herein canceled.

Finally, the Patent Office cited the reference to “the protective-carrier sheeting” in line 4 of claim 22 as lacking antecedent basis. Claim 22 has been amended to provide antecedent basis by citing “a layer of protective-carrier sheeting” that covers at least one of the layers of conductive foil and then subsequently referencing “the covered layer of conductive foil and the covering layer of protective-carrier sheeting.”

In view of the above amendments, Applicants respectfully request that each of the rejections under §112, second paragraph, be reconsidered and withdrawn.

35 U.S.C. §103

Claims 1-9, 11-21 and 23-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 4,875,283 (Johnston) in view of any one of WO 00/16596 (Pedretti); U.S. Patent 5,354,409 (Gotz); U.S. Patent 5,942,314 (Fisher *et al.*); or U.S. Patent 4,579,612 (Held).

Of the claims that have been rejected under §103, claims 1 and 13 are in independent form. Claim 1, as amended, specifies that a layer of protective-carrier sheeting extends from a protective-carrier-sheeting source and is sandwiched between two layers of conductive foil extended from one or more conductive-foil sources. Claim 1 further specifies that one of the conductive-foil layers is covered with a dielectric layer to sandwich the conductive-foil layer between the dielectric layer and the layer of protective-carrier sheeting. The steps are repeated

without the conductive-foil layers being bonded to the protective carrier sheeting or to the dielectric layer. Claims 2-9, 11 and 25 all depend directly or indirectly from claim 1 and, therefore, likewise incorporate these limitations.

Claim 13 specifies that a dielectric layer is sandwiched between two layers of conductive foil extended from one or more sources and that at least one of the layers of conductive foil is covered with a layer of protective-carrier sheeting extended from a protective-carrier-sheeting source. Claims 14-21 and 23 all depend directly or indirectly from claim 13 and, therefore, likewise incorporate these limitations.

Consequently, each of the claims rejected under §103(a) specifies (a) that a layer of protective-carrier sheeting extending from a protective-carrier-sheeting source covers a layer of conductive foil, (b) that a dielectric layer covers at least one of the conductive-foil layers, and (c) that the layers are stacked without the conductive-foil layers being bonded to the protective-carrier sheeting or to the dielectric layer.

Accordingly, pursuant to the methods of these claims, foil layers can be sandwiched as they are extended from their source(s); and the layers can immediately thereafter be stacked and cut in a single-stage, continuous process, thereby providing for efficient fabrication of laminates with reduced potential for contamination of the conductive foil. These methods are enabled, *e.g.*, by the configuration of the lay-up machine described on pages 7 and 8, where, for example, the method of claim 1 can be practiced by substituting an aluminum roll unwind in place of the conventional prepreg inserter.¹ None of the cited art discloses or suggests such an apparatus that would enable the practice of the claimed methods.

Johnston:

As indicated by the Patent Office, Johnston discloses a method for producing a plurality of printed wiring boards in a single processing step, wherein each wiring board comprises two layers of copper foil (*i.e.*, conductive foil) with a layer of prepreg (*i.e.*, a dielectric) sandwiched therebetween and with each wiring board being separated by a layer of aluminum foil (*i.e.*, a protective-carrier sheet). Johnston, however, does not disclose a method wherein a layer of

¹ See subject application (USSN 10/044,628), first paragraph on page 7.

protective-carrier sheeting is *extended from a source* (e.g., from a roll) when the layer is sandwiched between the copper foil layers.

Nevertheless, the Patent Office indicated that it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the sandwiching and covering steps of the method taught by Johnston wherein the copper foil layers and aluminum foil layers are provided as extended from a roll supply. Pedretti, Gotz, Fisher *et al.*, and Held were cited in support of the purported obviousness of this modification to the process of Johnston. However, as discussed below, none of these references disclose or suggest extending the protective-carrier sheeting from a source without bonding (*i.e.*, absent bonding the conductive-foil layer to the protective-carrier sheeting or to a dielectric layer before stacking); nor do the references disclose or suggest means for carrying out such a process wherein each of the layers is unbonded. The particular teachings of each of these secondary references is addressed, in turn, below.

Pedretti:

In Pedretti, two external sheets of copper are electro-mechanically or mechanically joined to one internal sheet of aluminum.² After the sheets are joined, they are passed through a cutter that crops the resulting bonded copper-aluminum-copper sandwich into square pieces.³

Pedretti, however, does not disclose or suggest stacking the conductive (copper) foil, protective-carrier (aluminum) sheeting and dielectric layer *without* first **bonding** the conductive (copper) foil to the protective-carrier (aluminum) sheeting.

To the contrary, Pedretti solves the problem of preventing contamination of the conductive foil by bonding the conductive foil to the protective-carrier sheeting and then cutting the bonded layers. Pedretti offers no suggestion or motivation for unrolling, sandwiching and stacking the three layers (including the layer of protective-carrier sheeting extended from its source) in a continuous process where contamination can be minimized absent this bonding of the layers before stacking.

² WO 00/16596, abstract.

³ *Id.*, page 8, lines 22-24.

Absent any teaching, suggestion, or motivation in Pedretti for covering a layer of conductive foil with a layer of protective-carrier sheeting extending from a source and stacking the conductive foil, protective-carrier sheeting and dielectric layer without first bonding the conductive foil either to the protective-carrier sheeting or to the dielectric layer, Applicants respectfully submit that Pedretti does not remedy the deficiencies of Johnston and that the combination of Pedretti and Johnston, therefore, does not render these claims obvious.

Gotz:

Gotz discloses a process for forming laminates wherein the core (3) is formed from a plurality of “core paper webs” supplied from rolls (2).⁴ The core (3) is sandwiched between foils (7).⁵ Gotz, however, does not disclose a layer of protective-carrier sheeting or any equivalent thereto. Further, the conductive-foil layers (7) are not extended from a roll or other source. Rather the conductive-foil layers (7) appear only to be provided in the form of pre-cut sheets.⁶

Because Gotz does not disclose these steps and because Gotz does not disclose the objective of preventing contamination of the conductive-foil surface, Applicants respectfully submit that Gotz does not remedy the deficiencies of Johnston and that the combination of Gotz and Johnston, therefore, does not render these claims obvious.

Fisher *et al.*:

In Fisher *et al.*, strips of copper foil are ultrasonically welded to a second metal (e.g., aluminum).⁷ The welded strips are then cut into the desired panel sizes.⁸ Subsequently, the welded panels are combined with a dielectric layer to form a laminate.⁹

Because the conductive foil (copper) and protective-carrier sheeting (aluminum) in Fisher *et al.* are bonded together before stacking with the dielectric layer, Fisher *et al.* does not remedy

⁴ US 5,354,409, Col. 4, lines 24-47.

⁵ *Id.*

⁶ *Id.*, see FIGS. 1 and 2.

⁷ US 5,942,314, Col. 1, lines 62-66.

⁸ *Id.*, Col. 2, line 4.

⁹ *Id.*, Col. 5, lines 54-57.

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the deficiencies of Johnston; and Applicants respectfully submit that these claims are, therefore, non-obvious in view of Johnston and Fisher *et al.*

Held:

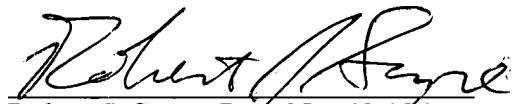
Held discloses providing copper foil from rolls (6) and (7).¹⁰ The copper foil is sandwiched around a core provided by rolls (5).¹¹ Held, however, does not disclose use of a layer of protective-carrier sheeting. Rather than using protective-carrier sheeting to protect the outer surfaces of the copper foil, Held uses scrapers (23) and (24) to remove dust from the foil surfaces.¹²

Because Held fails to disclose or suggest use of a layer of protective-carrier sheeting, much less such a layer unbonded and extended from a source, Applicants respectfully submit that the claims are non-obvious over Johnston and Held.

CONCLUSION

In view of the above amendments and remarks, Applicants respectfully request that a timely notice of Allowance be issued in this case. If there are any questions regarding these amendments and remarks, the Examiner is encouraged to contact the undersigned at the telephone number provided below.

Respectfully submitted,



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¹⁰ US 4,579,612, Col. 3, lines 56-63.

¹¹ *Id.*, Col. 4, lines 10-14.

¹² *Id.*, Col. 4, lines 22-24.